Billion – a 1 followed by 9 zeroes; 1,000 millions

1,000,000,000

Estimate – an answer close to, or approximating, an exact answer

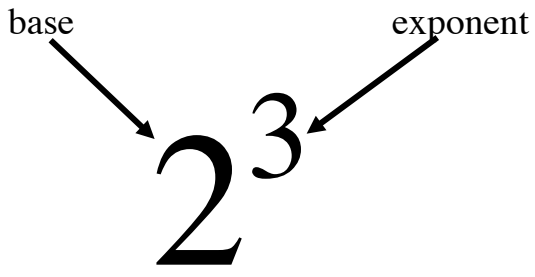
About how much candy is in the jar?

About 20 pieces

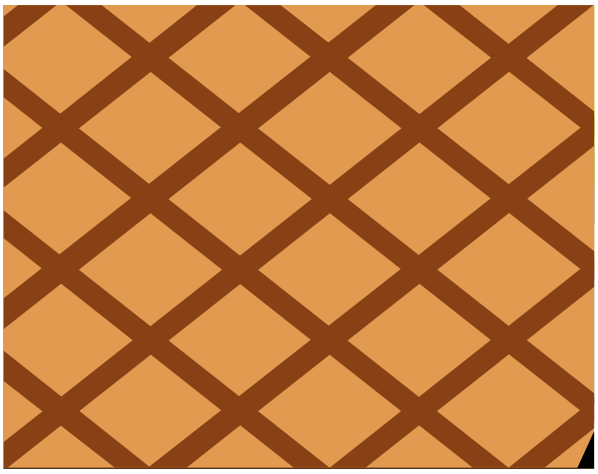
Extended Multiplication Fact – variations of basic arithmetic facts involving multiples of 10, 100, and so on

4 * 6 = 24
So . . .
4 * 60 = 240
4 * 600 = 2,400
40 * 60 = 2,400
Etc.

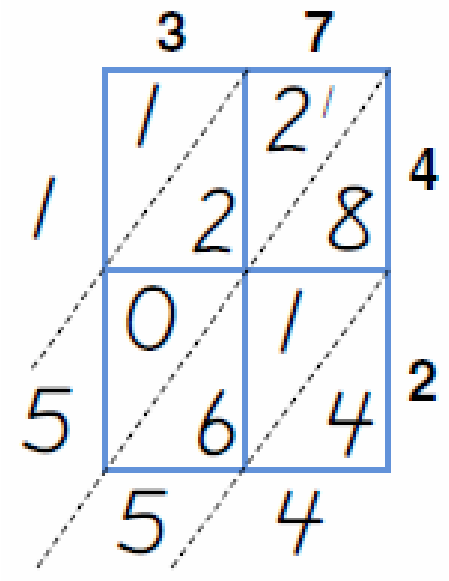
Exponent – a small raised number used in exponential notation to tell how many times the base is used as a factor



Lattice – an open framework made of strips of metal or wood that form an interwoven pattern



Lattice Multiplication – a very old algorithm for multiplying multi-digit numbers that requires only basic multiplication facts and addition of 1-digit numbers



An example of 37 * 42

Magnitude Estimate – a rough estimate of whether a number is in the tens, hundreds, or thousands, or other powers of 10

How many people live in the U.S.?

- 300 thousand?

- 300 million?

- 200 billion?

Million – a 1 followed by 6 zeroes; 1,000 thousands = 1 million

1,000,000

Partial Products – a multiplication algorithm in which partial products are computed by multiplying the value of each digit in one factor by the value of each digit in the other factor; the final product is the sum of the partial products

Example $43 * 26 = ?$

Think of 26 as 20 + 6.

Think of 43 as 40 + 3.

Multiply each part of 26 by each part of 43.

Add the four partial products.

$43 * 26 = 1{,}118$

	100s	10s	1s	
		2	6	
*		4	3	
$40 * 20 \rightarrow$	8	0	0	extended multiplication facts
$40 * 6 \rightarrow$	2	4	0	
$3 * 20 \rightarrow$		6	0	
$3 * 6 \rightarrow$		1	8	basic multiplication fact
	1 , 1	1	8	

Power of 10 – a number that can be written in the form 10^n where n is a counting number

$$10 = 10^1$$

$$100 = 10^2$$

$$1{,}000 = 10^3$$

Quadrillion – a 1 followed by 15 zeroes

1,000,000,000,000,000

Quintillion – a 1 followed by 18 zeroes

1,000,000,000,000,000,000

Round – to approximate a number to make it easier to work with, or to make it better reflect the precision of the data

Round Down – approximate smaller than the actual value

$426 \approx 400$ $420 \approx 420$

Round Up – approximate larger than the actual value

$392 \approx 400$ $392 \approx 390$

Scientific notation – a system for representing numbers in which a number is written as the product of a power of 10 and a number that is at least 1 and less than 10.

$$4,300,000 = 4.3 * 10^{6}$$

$$0.00001 = 1 * 10^{-5}$$

Sextillion – a 1 followed by 21 zeroes

1,000,000,000,000,000,000,000

Trillion – a 1 followed by 12 zeroes; 1 thousand billion equal a trillion

1,000,000,000,000